UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

NMFS Tracking
No.: 2003/01659

September 13, 2004

Thomas F. Mueller
Chief Regulatory Branch
Department of the Army
Seattle District Corps of Engineers
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Campbell Dock Project, Chelan County, Washington (COE No.: 200100020)

Dear Mr. Mueller:

Enclosed is a document containing a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed Campbell Dock Project, Chelan County, Washington. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Upper Columbia River (UCR) Spring-run chinook salmon (*Oncorhynchus tshawytscha*) and UCR Steelhead (*O. mykiss*). As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also contains a consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook and coho salmon. As required by section 305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions, please contact Justin Yeager of the Washington State Habitat Branch Office at (509) 925-2618 or electronic mail at justin.yeager@noaa.gov.

Sincerely,

D. Robert Lohn
Regional Administrator

Enclosure

cc: Debbie Knaub, Corps of Engineers

Endangered Species Act Section 7 Consultation
Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Campbell Dock
Upper Columbia River Spring-run Chinook Salmon
Upper Columbia River Steelhead
Hydrologic Unit Code: Swakane Creek - 170200100203
Chelan County, Washington

Lead Action Agency:	U.S. Army Corps of Engineers
U.S. Army Corps of Engineers No.:	200100020
Consultation Conducted By:	National Marine Fisheries Service Northwest Region
Date Issued:	September 13, 2004
Issued by:	for Michael R Crouse D. Robert Lohn Regional Administrator
NMFS Tracking No.:	2003/01659

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INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with NOAA's National Marine Fisheries Service (NOAA Fisheries) and the United States Fish and Wildlife Service (USFWS) (together "the Services"), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. This document includes a biological opinion (Opinion) which is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402. The proposed project is in the geographic range of the Upper Columbia River (UCR) Spring-run chinook salmon (*Oncorhynchus tshawytscha*) and UCR steelhead (*O. mykiss*) evolutionarily significant units (ESUs).[1] Both ESUs are listed as endangered under the ESA.

The analysis below also fulfills the Essential Fish Habitat (EFH) consultation requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as amended (16 U.S.C. 1801 *et seq.*). The MSA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)). The EFH species for this proposed action are chinook and coho (*O. kisutch*) salmon.

The United States Army Corps of Engineers (COE) proposes to issue permits to Mr. Campbell to construct one residential over-water structure in the Columbia River. The COE is proposing the action according to its authority under section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and section 404 of the Clean Water Act (33 U.S.C. 1344).

[1] 'ESU' means an anadromous salmon or steelhead population that is either listed or being considered for listing under the ESA, which is substantially isolated reproductively from conspecific populations, and represents an important component of the evolutionary legacy of the species (Waples 1991). An ESU may include portions or combinations of populations more commonly defined as stocks within or across regions.

Background and Consultation History

On December 29, 2003, NOAA Fisheries received a referenced biological evaluation - specific project information form (RBE-SPIF) and EFH assessment for the Campbell Dock Project. NOAA Fisheries and the COE discussed whether this project would fall under Regional General Permit Number Five for Over-water Structures in the Mid-Columbia River, and its addendum signed on May 18, 2004. The agencies mutually agreed that it would not, and formal consultation was initiated on June 30, 2004. The consultation also included numerous telephone conversations, meetings, and electronic mail between NOAA Fisheries staff, the applicant, the USFWS, and the COE. These are included in the administrative record on file at NOAA Fisheries Washington State Habitat Office in Lacey, Washington.

Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Additionally, the MSA (16 U.S.C. 1855(b)(2)) defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the COE proposes to issue permits that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

Dock

The proposed project includes the installation of one temporary[1] residential over-water structure consisting of a pier, ramp, and float. The pier will be 4 feet by 67 feet and the ramp will be 3 feet by 10 feet. Both will be 100% grated with at least 60% open area[2]. The float will be 8 feet by 20 feet with at least 50% of the float having functional[3] grating rated at 60% open area. The dock components will be supported by 10, 5-inch polyvinylchloride (PVC) encased concrete piles and two 350-pound concrete anchors.

Vegetation Enhancement

The proposed project includes measures to enhance riparian vegetation. Two mitigation planting units shall be installed. Plants will be installed no later than the first dormant season following dock installation and the applicant will maintain 100% survival of all planted trees and shrubs during the first and second years after planting. During the third through fifth years after planting, 80% survival is targeted. The applicant will protect the vegetation units against predation, and replace individual plants that die with native shrubs and trees.

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1 Temporary floats must be removed annually from March 1 to June 30.

2 The percent open area is a relative measure of the degree light can pass through the grating.

3 Functional grating is material that is not covered or blocked underneath by any objects (*e.g.,* framing, flotation tubs, etc.) For more information, see the Seattle COE website Appendix A of the Reference Biological Assessment Form at http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/MidColRefBA.pdf

Monitoring procedures: Vegetation enhancement areas will be monitored on an annual basis. A written report will be provided to the COE within 12 months of installation. Monitoring will begin the first year after vegetation has been planted and continue for five years after each unit has been completed. All reports are to be accompanied by photo documentation taken from consistent locations, showing all enhancement areas.

Description of the Action Area

An action area is defined by the Services' regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area affected by the proposed action starts at the Rocky Reach Dam at river mile (RM) 473.7 and extends upstream to Wells Dam at RM 515.8. This area serves as a rearing, holding, and migratory corridor for juvenile and adult UCR Spring-run chinook salmon and UCR steelhead. It also serves as EFH for chinook and coho salmon.

ENDANGERED SPECIES ACT

Biological Opinion

This Opinion presents NOAA Fisheries' review and analysis of the status of each ESU considered in this consultation, the effects from the environmental baseline in the action area, all the effects of the action as proposed, as well as interrelated and interdependent actions, and cumulative effects. NOAA Fisheries analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESUs. See, 50 CFR 402.14(g). In areas where critical habitat has been designated for listed species, NOAA Fisheries must also determine whether the action destroys or adversely modifies the designated critical habitat. If the action under consultation is likely to jeopardize an ESU, NOAA Fisheries must identify any reasonable and prudent alternatives for the action that avoid jeopardy and meet other regulatory requirements (50 CFR 402.02).

Status of the ESUs

This section defines range-wide biological requirements of each ESU, and reviews the status of the ESUs relative to those requirements. The present risk faced by each ESU informs NOAA Fisheries' determination of whether additional risk will 'appreciably reduce' the likelihood that an ESU will survive and recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the ESU will be an appreciable reduction (see, McElhaney et al. 2000).

Upper Columbia River Spring-run Chinook Salmon

The UCR Spring-run chinook salmon ESU was listed as endangered on March 24, 1999 (64 FR 14308). This ESU includes all natural-origin, stream-type chinook salmon from river reaches above

Rock Island Dam and downstream of Chief Joseph Dam, including the Wenatchee, Entiat, and Methow River basins. All chinook in the Okanogan River are ocean-type and are considered part of the UCR summer- and fall-run ESU. The spring-run components of the following hatchery stocks are also listed: Chiwawa, Methow, Twisp, Chewuch, and White rivers and Nason Creek. The UCR Spring-run chinook salmon migrate and rear in the action area and are present during their smolt and adult migrations. Critical habitat is not currently designated for UCR Spring-run chinook, although a designation may be forthcoming[4].

Life History (Including Ocean). The UCR Spring-run chinook salmon exhibit classic stream-type life-history strategies: emigrating from freshwater as yearling smolts and undertaking extensive offshore ocean migrations. The majority of these fish mature at four years of age and return to the Columbia River from March through mid-May.

Population Trends and Risks. On April 4, 2002, NOAA Fisheries defined interim abundance recovery targets for each spawning aggregation in this ESU. These numbers are intended to be an interim surrogate for the number and productivity of naturally produced spawners that may be needed for recovery, in the context of whatever take or mortality is occurring. They should not be considered in isolation, as they represent the numbers that, taken together, may be needed for the population to be self-sustaining in its natural ecosystem. For UCR Spring-run chinook salmon, the interim recovery levels are 3,750 spawners in the Wenatchee River, 500 spawners in the Entiat River, and 2,000 spawners in the Methow River.

All three of the existing UCR Spring-run chinook salmon populations have exhibited similar trends and patterns in abundance over the past 40 years. The 1998 status review (Myers *et al.* 1998) reported that long-term trends in abundance were generally negative, ranging from negative 5% to positive 1%. Analyses of the data series, updated to include 1996-2001 returns, indicate that those trends have continued. Based on redd count data series, spawning escapements for the Wenatchee, Entiat, and Methow rivers have declined an average of 5.6%, 4.8%, and 6.3% per year, respectively, since 1958. In the most recent 5-year geometric mean (1997-2001), spawning escapements were 273 for the Wenatchee population, 65 for the Entiat population, and 282 for the Methow population, only 8% to 15% of the interim abundance recovery targets, although escapement increased substantially in 2000 and 2001 in all three river systems. Based on 1980-2000 returns, the average annual growth rate for this ESU is estimated as 0.85 (a growth rate of less than 1.0 is non-viable). Assuming that population growth rates were to continue at 1980-2000 levels, UCR Spring-run chinook salmon populations are projected to have very high probabilities of decline within 50 years (87% to 100%), and the ESU is likely to go extinct.

Upper Columbia River Steelhead

The UCR steelhead ESU was listed as endangered on August 18, 1997 (62 FR 43937). This ESU includes all natural-origin populations of steelhead in the Columbia River basin upstream from the Yakima River in Washington to the U.S./Canada border. The Wells Hatchery stock is included among the listed populations. NOAA Fisheries has initially identified three important spawning

4 Under development. On April 30, 2002, the U.S. District Court for the District of Colombia approved a NOAA Fisheries consent decree withdrawing a February 2000 critical habitat designation for this and 18 other ESUs.

populations within this ESU: the Wenatchee, Entiat, and Methow populations (Interior Technical Recovery Team 2003). The UCR steelhead migrate and rear in the action area and are present during their smolt and adult migrations. Critical habitat is not presently designated for UCR steelhead, although a designation may be forthcoming[4 above].

Life History. Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, smolt age is dominated by two- and three-year-olds and some of the oldest smolt ages for steelhead, up to seven years, are reported from this ESU. Based on limited data, steelhead from the Wenatchee and Entiat rivers return to freshwater after one year in salt water, whereas Methow River steelhead primarily return after two years in salt water. Similar to other inland Columbia River basin steelhead ESUs, adults typically return to the Columbia River between May and October and are considered summer-run steelhead. Adults may remain in freshwater up to a year before spawning. Unlike chinook salmon or sockeye salmon, a fraction of steelhead adults attempt to migrate back to the ocean. These fish are known as kelts, and those that survive will migrate from the ocean to their natal stream to spawn again.

Population Trends and Risks. On April 4, 2002, NOAA Fisheries defined interim abundance targets for spawning populations that comprise this ESU and a composite productivity objective for the ESU (Lohn 2002). The productivity target is a geometric mean natural return rate of 1.0 or greater over a sufficient length of time to ensure survival and recovery of the ESU. The interim abundance targets are 2,500 spawners in the Wenatchee Subbasin, 500 spawners in the Entiat Subbasin, and 2,500 spawners in the Methow Subbasin. NOAA Fisheries developed these interim targets to help subbasin and recovery planners understand the approximate scale of improvement that will likely be needed to recover this ESU. NOAA Fisheries expects that these targets will change as better information is developed through these planning efforts.

Returns of both hatchery and naturally produced steelhead to the Upper Columbia River have increased in recent years. The average 1997-2001 return counted through the Priest Rapids fish ladder was approximately 12,900 fish. The average for the previous five years (1992-1996) was 7,800 fish. Abundance estimates of returning naturally produced UCR steelhead have been based on extrapolations from mainstem dam counts and associated sampling information (*e.g.*, hatchery/wild fraction, age composition). The natural component of the annual steelhead run over Priest Rapids Dam increased from an average of 1,040 (1992-1996), representing about 10% of the total adult count, to 2,200 (1997-2001), representing about 17% of the adult count during this period of time (West Coast Salmon BRT 2003).

In terms of natural production, recent population abundances for both the Wenatchee and Entiat aggregate population and the Methow population remain well below the interim recovery levels developed for these populations (West Coast Salmon BRT 2003). A five-year geometric mean (1997-2001) of approximately 900 naturally produced steelhead returned to the Wenatchee and Entiat rivers (combined) compared to a combined abundance target of 3,000 fish. Although this is well below the interim recovery target, it represents an improvement over the past (an increasing trend of 3.4% per year). However, the average percentage of natural fish for the recent five-year period dropped from 35% to 29%, compared to the previous status review. For the Methow population, the five-year geometric mean of natural returns over Wells Dam was 358. Although this is well below the interim recovery target, it is an improvement over the recent past (an increasing trend of 5.9% per year). In

addition, the 2001 return (1,380 naturally produced spawners) was the highest single annual return in the 25-year data series. However, the average percentage of wild origin spawners dropped from 19% for the period prior to the 1998 status review to 9% for the 1997 to 2001 returns.

Environmental Baseline

The environmental baseline is defined as "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). NOAA Fisheries evaluates the relevance of the environmental baseline to the species' current status. In describing the environmental baseline, NOAA Fisheries evaluates the condition of essential features of critical habitat, if designated, and its ability to support the listed ESUs.

Generally, the environment for listed species in the Columbia River Basin (CRB), including those species that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams, including the two that border the action area, have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Columbia River, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The two dams that define the action area yield the same effect as the other seven dams in the migration corridor of the Columbia River, killing or injuring a portion of the smolts passing through the area. Above, below, and within the action area, the low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). Similarly, within and outside of the action area, formerly complex mainstem habitats in the Columbia River have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in the Columbia River has declined, reducing habitat complexity and altering the river's food webs (Maser and Sedell 1994).

Specifically, the action area consists of the impoundment of the Columbia River behind Rocky Reach Dam. The Rocky Reach Reservoir (Lake Entiat) extends 41 miles upstream to the tailrace of Wells Dam. Lake Entiat has a surface area of 8,167 acres, a volume of 431,500 acre-feet, an average depth of 42 feet, and a shoreline length of 93 miles. The Entiat and Chelan Rivers are the major tributaries flowing into the Reservoir. A broad river valley surrounds the reservoir and land use includes apple orchards that line both sides of the Columbia River. There are also private residences, residential subdivisions, various commercial uses, and Lincoln Rock State Park. In addition, other state and federally-owned lands are located in the vicinity of Rocky Reach Dam.

The mid-Columbia dams operate as run-of-river facilities with limited storage capacities and rapid flushing rates. Flushing rates average 2.6 days in the five mid-Columbia reservoirs, with a minimum of five hours at Rock Island Dam in June; Lake Entiat typically flushes in one to three days. Water velocities average from 0.3 to 0.9 meters/second between Wells Dam and Priest Rapids Dam. Lake

Entiat is considered to have characteristics more typical of a river than a lake in terms of salmonid habitat. Productivity is low and is governed primarily by conditions in Lake Roosevelt. Productivity is locally dependent on detritus, periphyton, and macrophytes rather than phytoplankton.

On the Lake Entiat Reservoir, over-water structures and boat lifts are increasing in number. Over the past three years, the COE has been undergoing a review of docks culminating with the Regional General Permit Number Five programmatic consultation. This allows 25 docks to be built on each of the three reservoirs on the Columbia River from 2003 to 2008, after which another analysis will be completed.

On March 19, 2001, a consultant visited the project site and performed a snorkel survey of the dock location. The survey revealed the following information. The slope of the beach was variable along the shoreline, but never exceeded approximately five horizontal to one vertical foot. The substrate was composed of sand, with some angular gravel and cobble, from the beach to about 10 feet waterward of the beach. At that point, the water depth was about 2 feet, and the slope decreased. The substrate from a depth of 2 feet and beyond was sand/silt, with some scattered gravel and cobble out to about 60 feet from shore. The slope beyond a depth of 2 feet was approximately 3% out to approximately 100 feet from shore, where the depth was 58 inches. Beyond 100 feet from shore the slope increased gradually, exceeding 10% at 175 feet from shore where the depth was 7 feet.

Aquatic vegetation within the project site first appeared at a depth of approximately 3 feet (50 feet from shore), where sparse patches of Eurasian milfoil (*Myriophyllum spicatum*) were scattered about on the substrate. Dense milfoil patches were closely spaced at a depth of approximately 4 feet (70 feet from shore), and milfoil coverage was continuous by 80 feet from shore. Most of the aquatic vegetation within the project site was probably dormant; only portions of stems were apparent in many places. A snorkel survey of the adjacent property to the north in October 2000 found dense aquatic vegetation, including curly pondweed (*Potamogeton crispus*) and elodea (*Elodea canadensis*), which were present from a depth of 3 feet to beyond the limit of the snorkel survey. In that survey, elodea coverage was continuous at a depth of 4 feet and dense stands of milfoil and curly pondweed obscured the substrate beyond 80 feet from shore. Composition of the aquatic vegetation community is likely similar at the project site during late summer. Substrate characteristics at the project site are identical to the neighboring site, and depths are also similar.

There was some woody debris along the shoreline of the project site and a 15-foot long by 6-inch diameter log with rootwad attached at 70 feet from shore immediately south of the proposed dock location. Structural complexity for fish habitat was provided primarily by macrophytes. Fish observed during the snorkel survey include six juvenile sticklebacks (*Gasterosteus aculeatus*) around aquatic vegetation in shallow water. No salmonids were observed during the site visit. Water temperature at the time of the site visit was 7.5°C (45°F), within the range of temperatures preferred by most salmonids.

There was no apparent water velocity in the project site during the snorkel survey. The estimated water velocity at the adjacent property to the north in October 2000 was less than 0.15 meters per second (0.5 foot per second). However, the direction of flow was upstream instead of downstream. A point of land approximately 1,000 feet north or the project site causes a shear line and associated

back-eddy. The consequence of this geomorphology is that current direction within the project area is upstream. This condition persisted beyond 300 feet offshore where the snorkel survey was terminated.

The quality of the fish habitat at the project site would be valuable to juvenile salmonids as they outmigrate, because the low velocity affords them areas to rest, and the abundant aquatic vegetation gives them places to feed and hide. It would also benefit native and exotic predators. The abundant macrophytes would provide excellent largemouth bass (*Micropterus salmoides*) habitat. The project site is not ideal smallmouth bass (*Micropterus dolomieui*) habitat due to the dense macrophytes and lack of hard substrates and drop-offs. Both species of bass and northern pikeminnow inhabit nearshore areas with low velocity, such as the project site. Overall, this project will affect a small section of habitat that is used for adult migration and juvenile outmigration in the Columbia River. However, the project does contribute to the systemic degradation of habitat within the action area.

Effects of the Action

'Effects of the action' means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). If the proposed action includes offsite measures to reduce net adverse impacts by improving habitat conditions and survival, NOAA Fisheries will evaluate the net combined effects of the proposed action and the offsite measures.

'Indirect effects' are those that are caused by the proposed action and are later in time, but are reasonably certain to occur (50 CFR 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. To be considered indirect effects, such actions must be reasonably certain to occur, as evidenced by appropriations, work plans, permits issued, or budgeting; follow a pattern of activity undertaken by the agency in the action area; or be a logical extension of the proposed action.

'Interrelated actions' are those that are part of a larger action and depend on the larger action for their justification; 'interdependent actions' are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Future Federal actions that are not interrelated or interdependent with the action under consideration are not considered in this Opinion because they will undergo future section 7 analysis.

Turbidity. The COE proposes to permit construction in and near the water, which can mobilize sediments and temporarily increase local turbidity levels in the Columbia River. In the immediate vicinity of construction (several meters), the level of turbidity would likely exceed natural background levels, which would adversely affect fish. Quantifying turbidity levels, and their effect on fish species, is complicated by several factors. First, turbidity from an activity will typically decrease as distance from the activity increases. How quickly turbidity levels attenuate depends on the quantity of materials in suspension (*e.g.*, mass or volume), the particle size of suspended sediments, the amount and velocity of ambient water (dilution factor), and the physical/chemical properties of the sediments.

Second, the impact of turbidity on fish is not only related to the turbidity levels, but also the particle size of the suspended sediments, the temperature of the water, and the lifestage of the fish.

For salmonids, turbidity has been linked to a number of behavioral and physiological responses (*i.e.*, gill flaring, coughing, avoidance, increase in blood sugar levels) which indicate some level of stress (Bisson and Bilby 1982; Sigler *et al.* 1984; Berg and Northcote 1985; Servizi and Martens 1992). The magnitude of these stress responses are generally higher when turbidity is increased and particle size decreased (Bisson and Bilby 1982; Servizi and Martens 1987; Gregory and Northcote 1993). Although turbidity may cause stress, Gregory and Northcote (1993) have shown that moderate levels of turbidity (35-150 nephelometric turbidity units [NTUs]) accelerate foraging rates among juvenile chinook salmon, likely because of reduced vulnerability to predators (camouflaging effect).

The proposed action is expected to create short-term (a few hours) sediment pulses over a period of several days that are likely to be intense in the immediate vicinity of the project. Turbidity levels are expected to rapidly attenuate in an upstream direction until it drifts out of the eddy. The turbidity plume is expected to be confined to the left bank of the Columbia River. Accordingly, free swimming adult and juvenile salmonids that might be irritated by the elevated turbidity levels should have no trouble finding local refuge. In addition, the COE will require through its permit authority construction measures to minimize the amount of turbidity generated by the project, and ensure that the turbidity levels remain below lethal or injurious levels.

Lost Benthic Habitat. The footprint of the proposed project will permanently remove a maximum of seven square of benthic habitat in the Columbia River. While juvenile salmonids are opportunistic predators that eat a wide variety of invertebrate species, generally feeding on drifting invertebrates in streams, they are known to also forage on epibenthic prey on the stream bottom. As aquatic invertebrates are an important source of prey for salmonids, the loss of their habitat through burial, desiccation, or displacement may reduce foraging opportunities for listed salmonids. Therefore, this proposal's removal of benthic habitat could decrease feeding opportunities for juvenile salmonids, which must feed during their outmigration.

Fortunately, because aquatic invertebrates can recolonize disturbed locations quickly (Allan 1995) and adapt to new features in their environment, the relatively small footprint of the lost benthic habitat (seven square feet) relative to the total benthic habitat in the action area, and the relatively short time period of construction activities, the effects of lost benthic habitat will have a negligible effect to listed fish.

Predation. The grating and reflective dock components minimize the light/dark interface created by the over-water structures of the dock; the applicant will use conservative dock design criteria, such as surfacing 100% of the pier and ramp with grating to reduce the intensity of contrast in the light/dark interfaces relative to using opaque or other materials. Also, the float and pilings will be white, to reflect light, further reducing the light/dark interface over that of a standard design. However, using conservative dock design criteria does not eliminate the light/dark interfaces; it only reduces the area impacted (shaded) and/or degree of impact by dock structures over a standard design, by attempting to re-create more natural light conditions. The applicant's design proposes a structure that creates an area of mostly low-light intensity, with some areas of stark light/dark contrast.

The extent of increase in predation on salmonids in the Columbia River resulting from over-water structures is not well known, but, in- and over-water structure, in several ways, are known to benefit fish species that prey on juvenile salmonids. For example, Hoff (1991) documents increases of successful smallmouth bass nests of 183% to 443% and increases in catch/effort for fingerlings of 60% to 3,840% in Wisconsin lakes after the installation of half-log structures. He concluded that increasing nesting cover in lakes that have low nest densities, poor quality and/or quantity of nesting cover, and low first-year recruitment rates, can significantly increase recruitment of these piscivorous fish. Smallmouth bass have been observed to preferentially locate nest sites near artificial structures (Pflug and Pauley 1984; Hoff 1991). Literature and anecdotal evidence substantiate the use of docks and other structures by juvenile predators for rearing purposes. Juvenile predators may derive a survival advantage from use of these structures by avoiding predation by their larger conspecifics (Hoff 1991; Carrasquero 2001). The proposed action is likely to increase the amount of spawning and rearing habitat for predators, which could improve spawning success and lead to an overall increase in the predator population in the action area. Specifically, native (*e.g.*, northern pikeminnow (*Ptychocheilus oregonensis*)) and non-native (*e.g.*, smallmouth bass, black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis. annularis*), and yellow perch (*Perca flavescens*)).

In- and over-water structure can also create conditions that increase predation success. The four major predatory strategies utilized by piscivorous fish are: prey pursuit, prey ambush, prey habituation to a non-aggressive illusion, or prey stalking (Hobson 1979). Ambush predation is probably the most commonly employed predation strategy. Predators lie in wait, then dart out at prey in an explosive rush (Gerking 1994). Oftentimes, predators use sheltered areas that provide velocity shadows to ambush prey fish in faster currents (Bell 1991). In addition to velocity shadows, shade plays an important role in predation success. Petersen and Gadomski (1994) found that predator success was higher at lower light intensities apparently because prey fish lose their ability to school at low light intensities, making them vulnerable to predation (Petersen and Gadomski 1994). While prey species are better able to see predators under high light intensity, providing the prey species with a relative advantage (Hobson 1979). Walters *et al.* (1991) indicate that high light intensities may result in increased use of shade-producing structures by predators. Similarly, Bell (1991) states that "light and shadow paths are utilized by predators advantageously."

The light/dark interface conditions (*i.e.,* shadows) of in- and over-water structure allow ambush predators to remain in darkened areas (barely visible to prey) and watch for prey to swim by against a bright background (high visibility). Prey species moving around structure(s) are unable to see predators in dark areas under or beside structure(s) thus are more susceptible to predation. Juvenile salmonids, especially ocean type chinook (among others), may utilize backwater areas during their outmigration (Parente and Smith 1981). The presence of predators may force smaller prey fish species into less desirable habitats, disrupting foraging behavior, and depressing growth (Dunsmoor *et al.* 1991). Bevelhimer (1996), in studies on smallmouth bass, indicates that ambush cover and low light intensities create a predation advantage for predators and can also increase foraging efficiency. Ward (1992) found that stomachs of pikeminnow in developed areas of Portland Harbor contained 30% more salmonids than those in undeveloped areas, although undeveloped areas contained more pikeminnows.

Numerous analogous predation studies suggest that in- and over-water structures may cause serious predation impacts. The proposed action will add new in- and over-water structure, which may benefit

native predators, such as northern pikeminnow, and introduced predators, such as smallmouth bass, black crappie, white crappie, and potentially, yellow perch (Ward *et al.* 1994; Poe *et al.* 1991; Beamesderfer and Rieman 1991; Rieman and Beamesderfer 1991; Petersen *et al.* 1990; Pflug and Pauley 1984; Collis *et al.* 1995) by providing nesting locations and cover. The pilings, in addition to providing nesting habitat for predator species, will add velocity and light shadow areas. The proposed 10 pilings added to the action area will provide 10 velocity shadows of unknown size that expand and contract as discharge changes. These velocity shadow areas will likely be used by predators waiting to ambush migrating salmonid smolts.

In addition to piscivorous predation, in-water structures (tops of pilings) also provide perching platforms for avian predators such as double-crested cormorants (*Phalacrocorax auritis*) (Kahler *et al.* 2000), from which they can launch feeding forays or dry plumage. Placement of pilings to support the dock structures may provide resting and staging habitat for cormorants. To minimize the increase of predator advantage and its corollary effects to listed salmonids, the applicant will use conservative dock design criteria (grating and reflective materials, as identified above to reduce piscivor advantage), and place anti-perching devices on the top of the pilings to minimize the extent to which the dock conveys an advantage to avian predators.

Based on the presence of salmonids and native and non-native predators in the action area, and the additional shading and vertical structure created by the installation of a new dock, it appears likely that the proposed action will contribute to increased predation rates on listed juvenile salmonids. By increasing the amount of suitable rearing and spawning habitat for predators, the proposed action could increase the predator population in the action area, and increase the success of predators. Using the best available science, it is impractical at this time to quantify the number of listed salmonids that will be lost to predation as a consequence of the proposed action. When added to the environmental baseline, advantageous predator habitat created by this proposed action will likely result in only a minor increase in predation rates on listed salmonids, however, salmon stocks with already low abundance are susceptible to further depression by predation (Larkin 1979). Decreased juvenile-to-adult survival rates are a function of increased predation on listed salmonids, which itself is a consequence of increased predator populations, as introduced artificial habitat (dock and pier structure) improves or increases spawning, rearing, and ambush habitat for native and non-native predatory species.

Littoral Productivity. Shade from docks can negatively affect littoral productivity by inhibiting the growth of aquatic macrophytes and other plant life (*e.g.*, epibenthic algae and pelagic phytoplankton). While the proposed dock will add in- and over-water structure, the surfacing 100% of the piers and ramps with grating and using reflective materials for in-water components is expected to limit the amount and intensity of shade beneath the proposed structures.

To the degree that natural light beneath the structure is reduced, the shade from docks can affect the overall productivity of littoral environments (Kahler *et al.* 2000). Aquatic plant life is the foundation for most aquatic food webs and their presence or absence affects many higher trophic levels (*e.g.*, invertebrates and fishes). Autochthonous pathways are of overriding importance in the trophic support of juvenile salmonids (Murphy 1991). In large rivers, autotrophs are more abundant nearer the shore (Naiman *et al.* 1980). Consequently, the shade from this dock can affect the local plant/animal community structure or species diversity, but the small footprint of the dock relative to

the total surface area of littoral habitat in the action area makes the small amount of reduction in primary productivity unlikely to affect fish.

Boating Activity. Adding docks may increase levels of boating activity in the reservoirs, especially near the docks. Although the type and extent of boating activity that might be enhanced by the proposed action are outside of the discretionary action under consultation here, boating activity is interdependent activity that can cause several impacts on listed salmonids and aquatic habitat. Engine noise, prop movement, and the physical presence of boat hulls may disturb or displace nearby fishes (Mueller 1980; Warrington 1999).

Boat traffic increases turbidity and up-rooting of aquatic plants in shallow waters, increases aquatic pollution (through exhaust, fuel spills, or release of petroleum lubricants), and increases shoreline erosion. These boating impacts affect listed fish in a number of ways. Turbidity may injure or stress affected fishes. The loss of aquatic macrophytes may expose salmonids to predation, decrease littoral productivity, or alter local species assemblages and trophic interactions. Despite a general lack of data specifically for salmonids, pollution from boats are thought to potentially cause short-term injury, physiological stress, decreased reproductive success, cancer, or death for fishes in general. Further, pollution may also impact fishes by impacts to potential prey species or aquatic vegetation. Shoreline erosion can change hydraulic flow patterns, increase sedimentation and turbidity, and reduce riparian vegetation, and steepen bank and nearshore gradient.

The new dock will cause a small increase in boating capacity and possibly use in the Rocky Reach Reservoir. This may lead to some increases in turbidity, up-rooting of aquatic plants, pollution, and shoreline erosion. These effects would be very difficult to measure, but would be expected to have only a negligible effect on listed salmonids. The effect would be negligible because the scale of effects constitutes only a fraction of a percentage of littoral habitat that would be affected and the level of pollutants to be added by the boat would be dispersed to an undetectable level.

Population Scale Effects

NOAA Fisheries has estimated the median population growth rate (lambda) for each species affected by this project, and for both ESUs the lambda is under 1.0 which is essentially non-viable. Under the environmental baseline, life history diversity has been limited by the influence of hatchery fish, by physical barriers that prevent migration to historical spawning and/or rearing areas, and by water temperature barriers that influence the timing of emergence, juvenile growth rates, or the timing of upstream or downstream migration. In addition, hydropower development has profoundly altered the riverine environment and those habitats vital to the survival and recovery of the ESUs that are the subject of this consultation.

Pacific salmon populations are also substantially affected by variations in the freshwater and marine environments. Ocean conditions are a key factor in the productivity of Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, etc.) can play an important role in a species' survival and recovery, but those effects tend to be localized compared to the effects associated with the ocean. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. Freshwater survival is particularly important

during these periods because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species.

Specifically in the action area, the Campbell Dock Project is expected to add temporary, construction-related effects (turbidity and benthic food source) to the existing environmental baseline and long-term, minor increases in predation rates and predator populations. However, these effects are not expected to have any significance at the population level. Therefore, NOAA Fisheries believes that the proposed action is not likely to influence population trends of the affected ESUs.

Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future state or private activities, not involving Federal activities, which are reasonably certain to occur within the action area of the Federal action subject to consultation." These activities within the action area also have the potential to adversely affect the listed species. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being reviewed through separate section 7 consultation processes. Federal actions that have already undergone section 7 consultations have been added to the description of the environmental baseline in the action area.

State, tribal, and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may include changes in land and water uses, including ownership and intensity, any of which could adversely affect listed species or their habitat. While specific government actions are subject to political, legislative, and fiscal uncertainties, changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The result of these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and avoided or mitigated.

The state of Washington has various strategies and programs designed to improve the habitat of listed species and assist in recovery planning. Washington's 1998 Salmon Recovery Planning Act provided the framework for developing watershed restoration projects and established a funding mechanism for local habitat restoration projects. The Watershed Planning Act, also passed in 1998, encourages voluntary planning by local governments, citizens, and Tribes for water supply and use, water quality, and habitat at the Water Resource Inventory Area or multi-Water Resource Inventory Area level. Washington's Department of Fish and Wildlife and tribal co-managers have been implementing the Wild Stock Recovery Initiative since 1992. The co-managers are completing comprehensive species management plans that examine limiting factors and identify needed habitat activities. Water quality

improvements will be proposed through development of Total Maximum Daily Loads (TMDLs). The state of Washington is under a court order to develop TMDL management plans on each of its 303(d) water-quality-listed streams. It has developed a schedule that is updated yearly; the schedule outlines the priority and timing of TMDL plan development. These efforts should help improve habitat for listed species. Washington State closed the mainstem Columbia River to new water rights appropriations in 1995, but lifted this moratorium in 2002. The state has proposed to mitigate the effects of new appropriation by purchasing or leasing replacement water when Columbia River flow targets are not met. The efficacy of this program is unknown at the present time.

Specifically, in the Columbia River above Rocky Reach Dam, agricultural activities are the main land use. Riparian buffers are not properly functioning, containing little woody vegetation. Although land use practices that would result in take of endangered species is prohibited by section 9 of the ESA, such actions do occur. NOAA Fisheries cannot conclude with certainty that any particular riparian habitat will be modified to such an extent that take will occur. Riparian habitat is essential to salmonids in providing and maintaining various stream characteristics such as; channel stabilization and morphology, leaf litter, and shade. However, given the patterns of riparian development in the action area and rapid human population growth of Chelan County (27.5% from 1990-2000, U.S. Census Bureau), it is reasonably certain that some riparian habitat will be impacted in the future by non-Federal activities.

Conclusion

NOAA Fisheries has reviewed the direct and indirect effects of the proposed action and the interrelated and interdependent activities, along with cumulative effects, on the above listed species and their habitat. NOAA Fisheries evaluated these effects in light of existing conditions in the action area. The proposed action is likely to cause short-term adverse effects on listed salmonids through habitat modification and effects of construction activities. In addition, the proposed action is likely to cause long-term adverse effects on listed salmon by increasing predation. Because these effects are unlikely to reduce salmonid distribution, reproduction, or numbers in any meaningful way, the proposed action is not likely to jeopardize the continued existence of either listed UCR Spring-run chinook salmon or UCR steelhead.

Conservation Recommendations

Conservation recommendations are defined as "discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or regarding the development of information" (50 CFR 402.02). Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of threatened and endangered species. The conservation measures listed below are consistent with these obligations, and therefore should be implemented by the COE.

> The COE should evaluate the extent to which over-water structures, specifically docks and in-water structures, are being used by piscine predators for spawning, rearing, and predation on listed fish.

The COE should determine how many docks could potentially be built in the Upper Columbia River between Rock Island Dam and Chief Joseph Dam and assess the cumulative effects of docks and marinas in the Columbia River.

In order for NOAA Fisheries to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species, NOAA Fisheries requests notification of the achievement of any conservation recommendation when the COE submits its monitoring report describing action under this Opinion or when the project is completed.

Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

Incidental Take Statement

The ESA at section 9 (16 U.S.C. 1538) prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule (50 CFR 223.203). Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. 1532(19)). Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering" (50 CFR 222.102). Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR 17.3). Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 CFR 402.02). The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement (16 U.S.C. 1536).

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts of take and sets forth terms and conditions with which the action agency, the applicant, or both, must comply in order to implement the reasonable and prudent measures.

Amount or Extent of Take

As stated above, UCR Spring-run chinook salmon and UCR steelhead use the action area for migration, holding, and rearing purposes. Thus, UCR Spring-run chinook and UCR steelhead are

likely to be present in the action area and will likely encounter some of the effects of the proposed action. Therefore, incidental take of these listed fish is reasonably certain to occur, even though the proposed action includes measures to reduce the likelihood and amount of incidental take.

Take caused by the proposed action is likely to be in the form of harm. Harm is likely to result from increased turbidity during of the construction of the proposed dock, and from predation opportunity increases associated with the presence of the dock. The amount or extent of take is difficult, if not impossible, to estimate because the numbers of anadromous fish in any given area is highly variable over time, and is not strictly related to the habitat condition of the action area. In instances where the number of individual animals to be taken cannot be reasonably estimated, NOAA Fisheries uses a surrogate approach. The surrogate should provide an obvious threshold of authorized take which, if exceeded, provides a basis for reinitiating consultation.

This Opinion uses a habitat surrogate, which analyzes the physical and temporal extent of effects caused by adding a dock in the Rocky Reach Reservoir. The total over-water structure that produces a light/dark interface is 458 square feet. There will also be ten in-water pilings with a maximum diameter of 5-inches. The pilings will eliminate seven square feet of benthic habitat. Because NOAA Fisheries cannot estimate the number of fish that will be injured or killed by these occurrences, the extent of take anticipated in this statement is that which number of fish that will be harmed by the habitat loss and predation increases from the addition of up to ten, 5-inch piling, 458 square feet of additional over-water structure, and removing seven square feet of benthic habitat. Should any of these habitat-alteration thresholds be exceeded during project activities, the reinitiation provisions of this Opinion apply.

Reasonable and Prudent Measures

Reasonable and Prudent Measures (RPMs) are non-discretionary measures to minimize take. They must be implemented consistently with the terms and conditions below for the exemption in section 7(o)(2) to apply. The COE has the continuing duty to regulate the activities covered in this incidental take statement. If the COE fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish caused by implementation of the action:

1. The COE shall avoid or minimize incidental take from administration of the regulatory program for section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act of 1899, as covered in the proposed Campbell Dock Project.

2. The COE shall avoid or minimize incidental take from general construction.

3. The COE shall avoid or minimize incidental take from in- and over-water structures.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure No. 1 the COE shall ensure:

   a. Full implementation. Departure from full implementation of the terms and conditions of the following incidental take statement will result in the lapse of the protective coverage of section 7(o)(2) regarding 'take' of listed species and may lead NOAA Fisheries to a different conclusion as to the effects of the continuing action, including findings that specific projects will jeopardize listed species.

   b. Project access. Require landowners to provide reasonable access[5] to projects permitted under this Opinion for monitoring the use and effectiveness of permit conditions.

   c. Salvage notice. Include the following notice with each permit issued, or in writing to each party that will supervise completion of the action.

      NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Northwest Office of NOAA Fisheries Law Enforcement at (206) 526-6133. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

   d. Vegetation enhancement. Ensure that the applicant or COE project successfully completes site restoration and vegetation enhancement for long-term adverse effects (if any) by requirement of the proposed enhancement activities.

      (1) The vegetation enhancement area will include native shrubs (sitka willow (*Salix sitchensis*), scouler willow (*S. scouleriana*), sandbar willow (*S. exigua*), Mackenzie's willow (*S. prolixa*), Pacific willow (*S. lasiandra*), yellow willow

[5] 'Reasonable access' means with prior notice to the applicant, the COE and NOAA Fisheries may at reasonable times and in a safe manner, enter and inspect permitted projects to ensure compliance with the reasonable and prudent measures, terms and conditions, in this Opinion.

(*S. lutea*), red osier dogwood (*Cornus stolonifera*)) and trees (black cottonwood (*Populus trichocarpa*) and Douglas fir (*Pseudotsuga menzieseii*)).

(2) Eighty percent survival of all planted trees and shrubs is required after planting the vegetation enhancement units. Individual plants that die must be replaced with native shrubs and trees taken from the species list above. All enhancement components will remain for the life of the project. Appropriate enhancement components will be planted by the following April 15 of the year after each project element has been completed.

(3) A vegetation enhancement planting and monitoring report will be due to NOAA Fisheries annually for five years from the date the vegetation is planted. The vegetation enhancement monitoring report will include written and photographic documentation on tree and shrub mortality and replanting efforts.

e. Reinitiation of contact. To reinitiate consultation, contact the Habitat Conservation Division (Washington State Office) of NOAA Fisheries.

2. To implement reasonable and prudent measure No. 2 the COE shall ensure:

a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

b. Timing of in-water work. Work below the bankfull elevation[6] will be completed between July 1 and February 28.

c. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Pollution and Erosion Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by construction operations. The plan must be available for inspection on request by COE or NOAA Fisheries.

(1) Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(i) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

[6] 'Bankfull elevation' means the height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such as average bank height, scour lines, and vegetation limits.

(ii) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(iii) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

e. Piling installation. Install permanent pilings as follows.

(1) Minimize the number and diameter of pilings, as appropriate, without reducing structural integrity.

f. Treated wood.

(1) Projects using treated wood[7] that may contact flowing water or that will be placed over water where it will be exposed to mechanical abrasion or where leachate may enter flowing water are not authorized, except for pilings installed following NOAA Fisheries' guidelines.[8] Treated wood pilings must incorporate design features to minimize abrasion of the treated wood from vessels, floats, or other objects that may cause abrasion of the piling.

(2) Visually inspect treated wood before final placement to detect and replace wood with surface residues and/or bleeding of preservative.

g. Preconstruction activity. Complete the following actions before significant alteration of the project area.

(1) Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

(2) Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

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[7]'Treated wood' means lumber, pilings, and other wood products preserved with alkaline copper quaternary (ACQ), ammoniacal copper arsenate (ACA), ammoniacal copper zinc arsenate (ACZA), copper naphthenate, chromated copper arsenate (CCA), pentachlorophenol, or creosote.

[8]Letter from Steve Morris, National Marine Fisheries Service, to W.B. Paynter, Portland District, U.S. Army Corps of Engineers (December 9, 1998) (transmitting a document titled Position Document for the Use of Treated Wood in Areas within Oregon Occupied by Endangered Species Act Proposed and Listed Anadromous Fish Species, National Marine Fisheries Service, December 1998).

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[9]).

(3) Temporary erosion controls. All temporary erosion controls will be in place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

h. Heavy Equipment Restrictions. Restrict use of heavy equipment as follows:

(1) Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground-pressure equipment).

(2) Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(i) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(ii) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, water body or wetland, unless otherwise approved in writing by NOAA Fisheries.

(iii) Inspect all vehicles operated within 150 feet of any stream, water body or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by COE or NOAA Fisheries.

(iv) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(v) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

[9]When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

i. Site preparation. Conserve native materials for site restoration.

(1) If possible, leave native materials where they are found.

(2) If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

(3) Stockpile any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

j. Site restoration. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Make the written plan available for inspection on request by the COE or NOAA Fisheries.

(1) General considerations.

(i) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(ii) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(iii) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(iv) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

3. To implement reasonable and prudent measure No. 3 the COE shall ensure:

a. General Criteria. Dock and ramp structures permitted will comply with the following:

(1) Piscivorus bird deterrence. Fit all pilings, mooring buoys, and navigational aids (*e.g.*, channel markers) with devices to prevent perching by piscivorus birds.

(2) Flotation. Permanently encapsulate all synthetic flotation material to prevent breakup into small pieces and dispersal in water.

(3) New floats, ramps, and piers will be 60% grated, including a minimum of 50% functional grating.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Background

The MSA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2));

- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (section 305(b)(4)(A));

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (section 305(b)(4)(B)).

The term "EFH" means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

An EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

Identification of Essential Fish Habitat

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: chinook; coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

Proposed Actions

The proposed action and action area are detailed above. The action area includes habitats that have been designated as EFH for various life-history stages of chinook and coho salmon.

Effects of Proposed Action

As described in detail in the effects of the action section of this document, the proposed action may result in short- and long-term adverse effects to a variety of habitat parameters.

1. The proposed action will result in a temporary risk of contamination of waters through the accidental spill or leakage of petroleum products from heavy equipment.

2. The proposed action will result in a short-term degradation of water quality (turbidity) because of instream construction activities.

3. The proposed action will result in the long-term removal of seven square feet of benthic habitat.

4. The proposed action will add 38 cubic feet of in-water structure and 458 square feet of over-water structure that will likely contribute to a long-term increase in predation on coho and chinook, as well as long-term increases in freshwater exogenous material (non-native predators).

Conclusion

NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for chinook and coho salmon.

Essential Fish Habitat Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. NOAA Fisheries understands that the conservation measures described in the BA will be implemented by the COE, and believes these measures are sufficient to minimize, to the maximum extent practicable, the following EFH effects; contamination of waters, suspended sediment, sound, benthic habitat removal, and predation. However, these conservation measures are not sufficient to fully address the remaining adverse affects to EFH. Consequently, NOAA Fisheries recommends that the COE implement the following conservation measures to minimize the potential adverse effects on EFH for chinook and coho:

1. To minimize EFH adverse affects No. 1 thru No. 4, the COE should:

    a. Confine construction impacts to the minimum area necessary to complete the project.

    b. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by construction operations. The plan should be available for inspection on request by COE or NOAA Fisheries, and include the components described in section 2.6.3(2)(d), above.

    c. Install permanent pilings using the minimum number and diameter of pilings, as appropriate, without reducing structural integrity.

    d. In site preparation, conserve native materials for site restoration; if possible, leave native materials where they are found; if materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration; stockpile any large wood, native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

    e. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored and make the written plan available for inspection on request by the COE or NOAA Fisheries.

    f. Piscivorus bird deterrence. Fit all pilings, mooring buoys, and navigational aids (*e.g.*, channel markers) with devices to prevent perching by piscivorus birds.

Statutory Response Requirement

Pursuant to the MSA (section 305(b)(4)(B)) and 50 CFR 600.920(k), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

The COE must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554) ("Data Quality Act") specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the Biological Opinion addresses these DQA components, documents compliance with the Data Quality Act, and certifies that this Biological Opinion has undergone pre-dissemination review.

Utility: This document records the results of two interagency consultations, completed under two separate legal authorities. The information presented in this document is useful to two agencies of the Federal government (NOAA Fisheries and Army Corps of Engineers), the project applicants, and the general public. These consultations help fulfill multiple legal obligations of the named agencies. The information is useful to the project applicants in that it helps them understand how their project affects ESA-listed salmonid species and how it addresses those effects. The information is also useful and of interest to the general public as it describes the manner in which public trust resources are being managed and conserved. The information presented in these documents and used in the underlying consultations represents the best available scientific and commercial information and has been improved through interaction with the consulting agency.

Integrity: This consultation was completed on a computer system managed by NOAA Fisheries in accordance with relevant information technology security policies and standards set out in Appendix III, "Security of Automated Information Resources," Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity:

Information Product Category: Natural Resource Plan.

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NOAA Fisheries ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 et seq., and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) implementing regulations regarding Essential Fish Habitat, 50 CFR 600.920(j).

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the literature cited section. The analyses in this biological opinion/EFH consultation contain more background on information sources and quality.
Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NOAA Fisheries staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

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